ATOP-R&D

Human Factors Newsletter # 06-04

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Technical Note: Allendoerfer, K., & Pai, S. (2006). *Human Factors Considerations for Passwords and other User Identification Techniques, Part 2 Field Study, Results and Analysis* (DOT/FAA/TC-06/09). Atlantic City International Airport, NJ: Federal Aviation Administration, William J. Hughes Technical Center.

Abstract
Within the Federal Aviation Administration (FAA) Air Traffic Organization (ATO), Technical Operations (TO) personnel ensure that the systems that make up the National Airspace System (NAS) function safely and effectively. TO personnel manage and maintain more than 44,000 pieces of NAS equipment and systems at over 6,000 facilities and locations. The FAA primarily employs knowledge-based user-identification techniques, such as usernames and passwords. The agency also employs token-based techniques, such as badge readers, to ensure that facilities, equipment, and personnel are secure.

In 2004, the Technical Operations Services organization became increasingly concerned about the number of usernames, passwords, and tokens that TO personnel were being expected to manage. The NAS Human Factors Group conducted a field study to examine the human factors implications of user-identification techniques currently employed at field sites to prevent unauthorized access to NAS equipment and information technology systems. Engineering research psychologists from the NAS Human Factors Group visited 13 TO field facilities and

conducted structured interviews with 52 employees working in TO. We interviewed participants about their experiences using current user-identification technologies and policies and collected their attitudes toward possible replacement technologies such as biometrics.

Most interviewees reported some difficulties with their usernames and passwords that led them to adopt coping strategies that could reduce overall information security. Interviewees reported problems such as too many passwords to remember, inconsistent password and username rules, systems requiring that passwords change too frequently, systems with too strict password reuse rules, a lack of grace logins, and difficulties resetting forgotten passwords.

Based on the findings of the interviews, we make the following recommendations. First, the agency should explore ways to reduce the number of usernames and passwords TO personnel are required to remember. Second, the agency should develop consistent rules for usernames and passwords across systems. Third, the agency should investigate password management tools. Fourth, FAA systems, especially those with safety or for time-critical functions, should allow at least one grace login where users can access systems even when passwords have expired. Fifth, the agency should provide more information and training to personnel on techniques to build secure passwords that have minimal impact on workload and operations. Sixth, for internal, less-critical systems, the agency should investigate techniques where users can update their passwords themselves. Seventh, the agency should closely investigate the human factors implications of increased use of tokens and implementation of biometrics. Finally, the agency should strive to make the information security requirements of systems match the sensitivity of the information in the system and consider their costs to users in terms of workload and efficient operations.

This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 5: Enhance the safety of FAA's air traffic systems.

Point of contact: K. Allendoerfer, WJHTC

New Grant Submission Process: Please be aware that all new proposals for the FAA Aviation Research Grants Program must be submitted electronically by researchers at http://www.grants.gov. This information is also posted on the FAA Grants Office website at http://www.tc.faa.gov/logistics/gov. Currently, the FAA Grants Office is accepting amended proposals for follow-on work through the mail. However, they will eventually be migrating toward submission of amendments through grants.gov. Requests for no-cost extensions are being accepted by e-mail. If and when that changes, we will notify you. *This activity supports the Administrator's Flight Plan Goal for Organizational Excellence, Objective 3: Make decisions based on reliable data to improve our overall performance and customer satisfaction.* (T. McCloy, ATO-P R&D)

Human Factors Certification: The Acquisition Workforce Council provides funding for specific training program areas in FY 2006, including Human Factors Professional Certification. Under this program, FAA employees may apply to the ATO-P Human Factors Research and Engineering Division (HFRED) for the opportunity to attend training and testing for human factors certification. Once approved, travel, per diem, and certification testing will be paid by HFRED up to a set maximum amount. Candidates must be fully qualified for certification prior

to the training/testing under current definitions of the existing and recognized certification programs. Provisions of this program are subject to change and approval by HFRED. If you are interested, please call or e-mail Glen Hewitt in the HFRED. *This activity supports the Administrator's Flight Plan Goal for Organizational Excellence, Objective 1: Make the organization more effective with stronger leadership, increased commitment of individual workers to fulfill organization-wide goals, and a better prepared, better trained, safer, diverse workforce.* (Glen Hewitt, ATO-P)

En Route Automation Modernization (ERAM): Researchers from the William J. Hughes Technical Center NAS Human Factors Group conducted an Early User Involvement Event on ERAM hardware in Rockville, Maryland February 7-9. The event was designed for Technical Operations personnel, and provided an early insight into the design and configuration of ERAM hardware (equipment racks, workstations, cabling, etc.) used at Air Route Traffic Control Centers. The event also previewed the ability of maintenance personnel to access and maintain equipment during normal operations. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 5: Enhance the safety of FAA's air traffic systems. It also supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers.* (T. Yuditsky, WJHTC)

ATC Automation: On February 28 – March 2, 2006, personnel from the William J. Hughes Technical Center Technical Center's NAS Human Factors Laboratory will support a meeting of the National Traffic Management Log working group. Research psychologists will assist the working group in defining requirements for system capabilities that automate manual tasks. They will analyze current procedures and information needs of the users to make sure that the automation is consistent with their mental model. They will also propose prototype designs for displays that will be used to implement new capabilities. One of the capabilities that will be discussed is the ability to receive automated confirmations (i.e., receipts) when an entry has been received by other facilities. This should reduce the number of telephone calls currently required to coordinate Traffic Management Initiatives. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 5: Enhance the safety of FAA's air traffic systems. It also supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers.* (T.Yuditsky, WJHTC)

EUROCONTROL Experimental Centre (EEC): EEC is the research and development arm of the EUROCONTROL agency. A snapshot of some recent, current, and upcoming activities of the EEC is available at:
http://www.eurocontrol.int/eec/public/standard_page/EEC_News_2006_1.html

Point of Contact: P. Krois, ATO-P R&D

***More information on human factors research can be found at
the FAA Human Factors (ATOP-R&D) web site***: http://www.hf.faa.gov

Paul Krois
FAA (ATO-P R&D Human Factors)

February 26-28, 2006 – Heli-Expo, Dallas, TX http://www.heliexpo.com

February 27-28, 2006 – NBAA Flight Operations Manual Workshop, Dallas, TX
http://web.nbaa.org/public/cs/fomw/200602/

February 28 – March 1, 2006 – 31st Annual FAA Aviation Forecast Conference, Wash, DC
http://www.faa.gov/news/conferences/aviation_forecast_2006/.

March 2-3, 2006 – APA Division 21(Applied Experimental Psychology), Division 19 (Military Psychology) and the Potomac Chapter, Human Factors and Ergonomics Society Mid-Year Symposium, George Mason University, Fairfax, VA
http://www.apa.org/divisions/div21/.homepage.html

March 8-9, 2006 – Avionics 06, Amsterdam, Netherlands www.avionics06.com

March 12-14, 2006 – AirCargo 2006, Sheraton Bal Harbour, FL
http://www.aircargoconference.com

March 13-15, 2006 – Flight Safety Foundation 18th Annual European Aviation Safety Seminar, Athens, Greece http://www.flightsafety.org/seminars.html#eass

March 20-23, 2006 – 16th Annual AAMI/FDA International Conference on Medical Device Standards and Regulation, Hyatt Regency, Reston, VA
http://www.aami.org/meetings/isc/index.html

March 22 - 25, 2006 - Society for Behavioral Medicine Annual Meeting and Scientific Sessions, San Francisco, CA   www.sbm.org/annualmeeting/index.html

March 22-23, 2006 - 16th Annual AAMI- FDA International Conference on Medical Device Standards and Regulation, Hyatt Regency, Reston, VA
http://www.aami.org/meetings/isc/index.html

March 23-25, 2006 - 17th Annual International Women in Aviation Conference, Opryland Hotel Nashville, TN http://www.wai.org/

March 23-27, 2005 – IA Summit 2006, Hyatt Regency, Vancouver, BC, Canada
http://www.iasummit.org/

March 25-29, 2006 – IEEE Virtual Reality Conference, Hilton Alexandria Mark Center, Alexandria, VA http://www.vr2006.org/

March 28-30, 2006 – Aviation Industry Expo, Las Vegas, NV
http://www.aviationindustryexpo.com

April 4-10, 2006 – Sun 'n Fun, Lakeland, FL http://www.sun-n-fun.org/content/

April 6-7, 2006 – National Human Capital Summit, Chicago Marriott Downtown, Chicago, IL
http://www.humancapitalinstitute.net/conference_national.html

April 17-19, 2006 – NBAA Maintenance Management Conference, Dallas, TX
http://web.nbaa.org/public/cs/mmc/200604/

April 18-20, 2006 – FAA Aviation Safety Programs Conference, Grand Hyatt Hotel, Denver,
CO http://www.aviationsafetyconference.com

April 22-27, 2006 – CHI 2006, Montreal, Quebec, Canada
http://www.chi2006.org/call/hcioverviews.php

April 23-28, 2006 - Avionics Systems Division Meeting, New Orleans, LA (TBD)
lemon@sae.org

April 24-26, 2005 – ATCA/FAA/NASA Annual Technical Symposium, Atlantic City, NJ
http://www.atca.org/activities/event_items.asp?month=4&year=2006&item_id=3557

April 25-27, 2006 – Maintenance, Repair & Overhaul (MRO) Conference & Exhibition,
Phoenix Civic Plaza, Phoenix, AZ http://www.aviationnow.com/conferences/mromain.htm

May 1-4, 2006 - 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and
Materials Conference; 14th AIAA/ASME/AHS Adaptive Structures Conference;
7th AIAA Gossamer Spacecraft Forum; 2nd AIAA Multidisciplinary Design Optimization
Specialist Conference; 1st AIAA Non-Deterministic Approaches Conference, Hyatt Regency
Newport, Newport, RI http://www.aiaa.org/

May 3-5, 2006 - 6th Annual European Business Aviation Convention & Exhibition
(EBACE2006)*, Geneva, Switzerland http://web.nbaa.org/public/cs/amc/*
May 9-11, 2006 – Flight Safety Foundation 51st Annual Corporate Aviation Safety Seminar,
Phoenix, AZ http://www.flightsafety.org/seminars.html#eass

May 14-18, 2006 - 77th Annual Scientific Meeting of the Aerospace Medical Association, Caribe
Royale Hotel, Orlando, FL http://www.asma.org/

May 15-16, 2006 – DoD TAG, Las Vegas, NV http://hfetag.dtic.mil/meetschl.html

May 15-16, 2006 – ASTM F38 Unmanned Aircraft Systems Committee Workshop, Sheraton
Centre Toronto; Toronto, ON CAN http://www.astm.org/

May 17-19, 2006 – 17th International Conference on Heating and Ventilation, Prague, Czech Republic http://www.acv2006.cz

May 22-24, 2006 - 9th IFAC Symposium on Automated Systems Based on Human Skill And Knowledge, Nancy, France http://www.cdc.gov/niosh/exhibits.html

May 23-25, 2006 – 2006 International Air Cargo Conference, Brown Convention Center, Houston, TX mailto:terryiacc@bellsouth.net

May 25-28, 2006 – American Psychological Society 18th Annual Convention, New York Marriott Marquis, New York City, NY http://www.psychologicalscience.org/convention/

June 6-8, 2006 – IEE System Safety Conference, Savoy Place, London, UK http://www.iee.org/events/event/CE202BA5-A0D3-8FE7-2F35A59A02C8B3F3

June 8-10, 2006 – NTSB Bar Association Annual CLE Conference, NTSB Conference Center, L'Enfant Plaza, Wash, DC http://www.ntsbbar.org/

June 11-14, 2006 – The American Society of Safety Engineers Safety 2006 Conference, Washington State Convention and Trade Center, Seattle, WA http://www.asse.org/2006pdcallforpapers.pdf

June 12-16, 2006 – UPA 2006 – 15th Annual Conference, Broomfield, CO http://www.usabilityprofessionals.org/conferences_and_events/upa_conference/2006/

June 24-26, 2006 – AAMI Conference & Exposition, Wash, DC http://www.aami.org/proposals/index.html

June 24-28, 2006 – ASHRAE Annual Conference, Quebec, Canada http://www.ashrae.org/

June 26-29, 2006 - General Aviation Technology Conference , Hyatt Hotel, Wichita, Kansas,

July, 2006 - 26th International Congress of Applied Psychology, Athens, Greece dgeorgas@dp.uoa.gr , http://www.erasmus.gr/dynamic/conventions.asp?conv_id=21r/dynamic/conventions.asp?conv_id=21

July 10-14, 2006 – IEA 2006, 16th World Congress on Ergonomics, Maastricht, The Netherlands http://www.iea2006.org/

July 24-30, 2006 – EAA AirVenture, Oshkosh, WI http://www.airventure.org/

July 26-29, 2006 – CogSci 2006, Sheraton Vancouver Wall Centre, Vancouver, BC, Canada http://www.cogsci.rpi.edu/~rsun/cogsci2006/

August 1, 2006 - The International Journal of Aviation Psychology, Special Issue on Air Traffic Control Human Factors, CALL FOR PAPERS. Please contact Jim Hitt at hitt_james@bah.com <mailto:hitt_james@bah.com> or Mike McAnulty at mike.mcanulty@faa.gov <mailto:mike.mcanulty@faa.gov> with any queries, or to submit papers.

August 10-13, 2006 – American Psychological Association Annual Meeting, New Orleans, LA
http://www.apa.org/convention05/future.html

August 21-24, 2006 - AIAA Modeling and Simulation Technologies Conference and Exhibit. Keystone Resort and Conference Center, Keystone, CO
http://www.aiaa.org/content.cfm?pageid=1

August 21-24, 2006 - AIAA Guidance, Navigation, and Control Conference and Exhibit, Keystone Resort and Conference Center, Keystone, CO
http://www.aiaa.org/content.cfm?pageid=1

September 6-8, 2006 - 11th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Renaissance Portsmouth, Portsmouth, VA,
http://www.aiaa.org/content.cfm?pageid=1

September 10-14, 2006 - 54th International Congress of Aviation and Space Medicine, Bangalore, India. A preliminary registration form may be found at http://www.isam-india.org/conference44/newreg.php.

September 12-14, 2006 – 23rd International Air Cargo Forum and Exposition, Calgary, Ontario, Canada http://www.tiaca.org

September 20-22, 2006 – HCI-Aero 2006, Seattle, WA http://www.eurisco.org/hci-aero2006
Note: Submission Deadlines:
15th March 2006 - Full Research Papers
15 April 2006 - Industry Papers
15 April 2006 - Early Stage Research Papers
15 April 2006 - Panels, Workshops
15 April 2006 - Posters and Demos

September 26-27, 2006 – AIAA Aviation Technology, Integration and Operations Conference, Hyatt Regency, Wichita, KS http://www.aiaa.org/content.cfm?pageid=1

October 8-11, 2006 - IEEE International Conference on Systems, Man, and Cybernetics, The Grand Hotel, Taipei, Taiwan http://ins.cn.nctu.edu.tw/smc2006/
March 1, 2006: Deadline for submission of papers (full papers only)

October 15-19, 2006 – Digital Avionics Systems Conference, 25th DASC Network Centric Environment: The Impact on Avionics and Systems, Hilton Portland and Executive Tower, Portland, OR www.dasconline.org

February 19, 2006 – Deadline for submitting abstracts of 1000 words

October 15-20, 2006 – 2ⁿᵈ Annual Augmented Cognition International Conference, Hilton San Francisco, San Francisco, CA www.augmentedcognition.org

October 16-20, 2006 – Human Factors and Ergonomics Society Annual Meeting, San Francisco Hilton, San Francisco, CA http://www.hfes.org/web/HFESMeetings/meetings.html
Key Dates:

March 1, 2006 - Proposals (all presentation types)

April 18, 2006 - Accept/reject letters sent

May 8, 2006 - Workshop preliminary handouts due

May 16, 2006 - Proceedings paper prep instructions available

May 22, 2006 - Workshop final acceptances sent

June 5, 2006 - Online preliminary program available

June 26, 2006 - Proceedings papers due

September 8, 2006 - Early registration deadline

October 17-19, 2006 – NBAA 59ᵗʰ Annual Meeting and Convention, Orlando, FL
http://web.nbaa.org/public/cs/amc/futuresites.php

October 23-25, 2006 – 44ᵗʰ Annual SAFE Symposium, Reno Hilton Hotel, Reno, NV
http://www.safeassociation.org/symposium.htm

October 23-26, 2006 - DoD Maintenance Symposium & Exhibition, Reno Hilton, Reno, Nevada http://www.sae.org/events/conferences/aerospace/

October 29 - November 1, 2006 – ATCA Convention and Exposition, Marriott Wardman Park, Wash, DC

November 9-11, 2006 – AOPA Expo 2006, Palm Springs, CA
http://www.aopa.org/expo/2005/virtual/

November 13-14, 2006 ASTM F38 Unmanned Aircraft Systems Committee Workshop, Hyatt Regency, Atlanta, GA http://www.astm.org/

January 8-11, 2007 - 45th AIAA Aerospace Sciences Meeting and Exhibit, Reno Hilton, Reno, NV http://www.aiaa.org/content.cfm?pageid=1

January 27-31, 2007 - ASHRAE Winter Meeting**,** Dallas, TX jyoung@ashrae.org, or www.ashrae.org.

May 21-22, 2007 - ASTM F38 Unmanned Aircraft Systems Committee Workshop, Waterside Convention Center, Norfolk, VA http://www.astm.org/

June 23-27, 2007 – ASHRAE Annual Meeting, Long Beach, CA jyoung@ashrae.org, www.ashrae.org

July 22-27, 2007 – 12th HCI International, Beijing, China http://www.hcii2007.org/

September 25-27, 2007 - NBAA 60th Annual Meeting and Convention, Atlanta, GA http://web.nbaa.org/public/cs/amc/futuresites.php

October 1-5, 2007 – Human Factors and Ergonomics Society Annual Meeting, Baltimore Waterfront Marriott Hotel, Baltimore, MD http://www.hfes.org/web/HFESMeetings/meetings.html

Note: Calendar events in Italics are new since the last Newsletter

Comments or questions regarding this newsletter?
Please contact Bill Berger at (334) 271-2928
or via e-mail at bill.ctr.berger @faa.gov